(19) Europäisches Patentamt
European Patent Office
Offi e européen des brevets

(11) Publication number: **0 461 874 A2**

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number: **91305295.7**

(51) Int. Cl.[5]: **B65D 88/20**

(22) Date of filing: **12.06.91**

(30) Priority: **15.06.90 GB 9013417**

(43) Date of publication of application:
18.12.91 Bulletin 91/51

(84) Designated Contracting States:
AT BE CH DE DK ES FR GR IT LI LU NL SE

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(54) Container apparatus for the storage and transportation of fluid material.

(57) Container apparatus (2) for the storage and transportation of fluid material, which container apparatus (2) comprising an outer bag (4) having an upper portion (6) and a bottom (8), non-collapsible frame means (10) for supporting the outer bag (4), and securing means (12) for temporarily maintaining the bottom (8) of the outer bag (4) adjacent a top part (11) of the frame means (10), the frame means (10) being such as to comprise a base (14) and support members (16) which upstand from the base (14), and the securing means (12) being such as temporarily to maintain the entire bottom (8) of the outer bag (4) adjacent the top part (11) of the frame means (10) whereby the raised outer bag (4) is at a height at which it is convenient to insert an inner bag (18) requiring to be filled with the fluid material.

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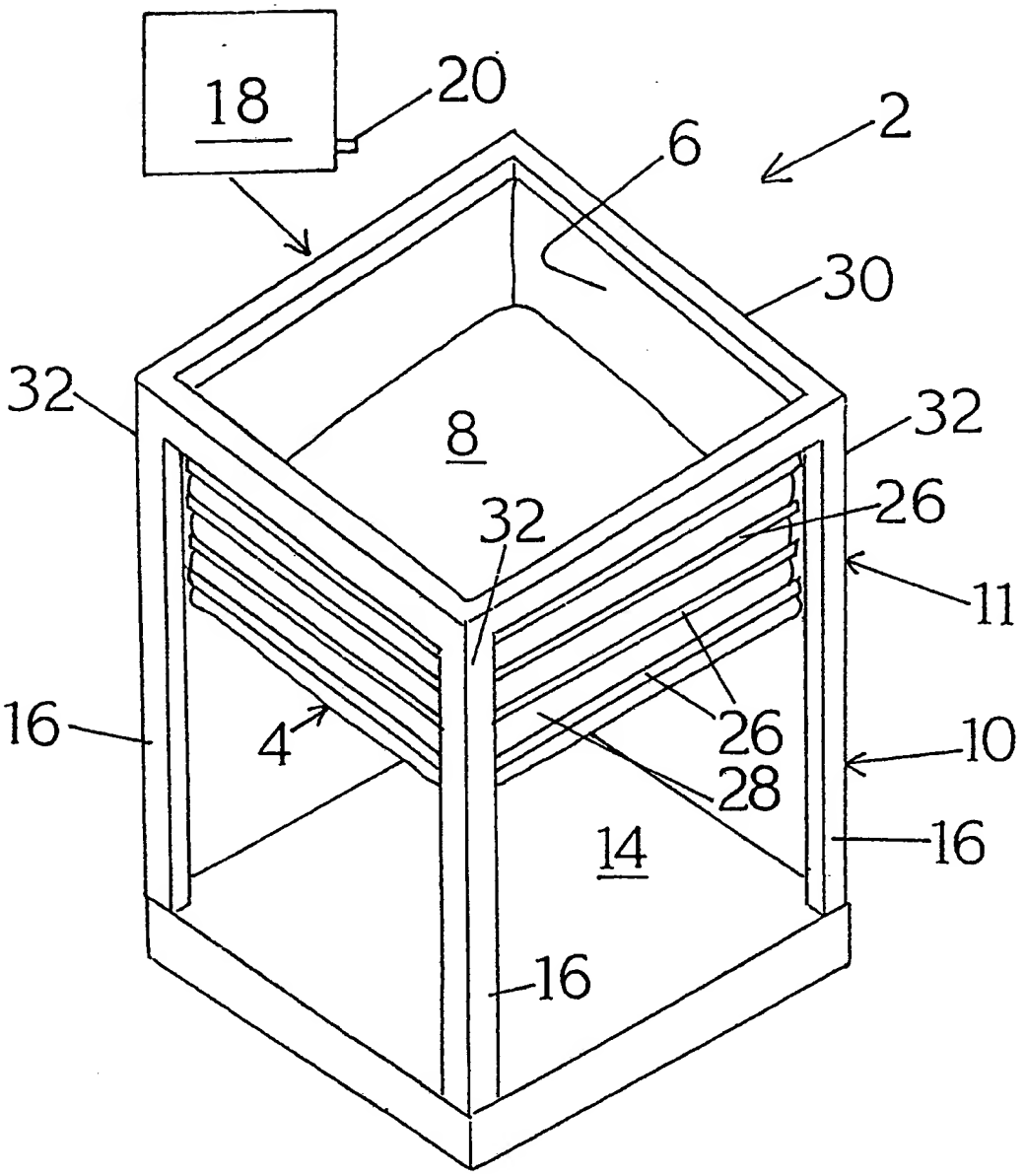

FIG 2

This inv ntion relates to container apparatus for th storage and transportation of fluid material such for exampl as liquids, powd rs and granular materials. The known container apparatus for the storage and transportation of fluid material is usually non-collapsible. One type of known container apparatus that is collapsible and that is currently in use is that disclosed in United Kingdom patent specification No.2189773. Usually the container apparatus has been made to be collapsible so that it can be returned after use, thereby avoiding the cost of providing new container apparatus each time it is desired to transport the fluid material.

We have now discovered that many manufacturers of fluid material tend to use the collapsible apparatus disclosed in United Kingdom patent specification No.2189773 not for the returnable feature which arises from the fact that the container apparatus is collapsible, but for the ease with which a disposable inner liner bag can be inserted into the container apparatus in its collapsed condition and then filled with the fluid material, for example a liquid such as a fruit juice.

Collapsible container apparatus is generally more expensive to produce than non-collapsible container apparatus. Thus the above mentioned manufacturers of fluid material who wish to hold the fluid material in the liner bag are having to use the more expensive collapsible container apparatus because they wish to have the ease of inserting the inner bag.

It is an aim of the present invention to provide container apparatus which is not collapsible but which is so constructed that it is easily able to receive an inner bag which can act as a liner bag for containing the fluid material.

Accordingly, in one non-limiting aspect, this invention provides container apparatus for the storage and transportation of fluid material, which container apparatus comprises an outer bag having an upper portion and a bottom, non-collapsible frame means for supporting the outer bag, and securing means for temporarily maintaining the bottom of the outer bag adjacent a top part of the frame means, the frame means being such as to comprise a base and support members which upstand from the base, and the securing means being such as temporarily to maintain the entire bottom of the outer bag adjacent the top part of the frame means whereby the raised outer bag is at a height at which is it convenient to insert an inner bag requiring to be filled with the fluid material.

The securing means may also be such as to p rform the functi n of raising the bottom of the bag if, f r example, it consists of a strap with a buckle or a n n-return ratchet.

Preferably, th container apparatus is one in which the bottom of the outer bag remains substantially parall l to the base of the frame means as it is raised. Also, preferably the container apparatus is one in which the bottom of the outer bag remains substantially parallel to the base of th frame means in the raised position of the outer bag.

The securing means may comprise a cable-operated securing means. Any other desired and appropriate type of securing means may however be employed.

The cable-operated securing means may comprise a plurality of cables, and a counter-weight or a spring for each cable.

Advantageously, the container apparatus is one in which the support members are hollow, and in which each one of the counter-weights operates inside one of the support members.

The container apparatus may include constraint means for constraining sides of the outer bag, the securing means being attached to the constraint means. The container apparatus may then be one in which the constraint means comprises a plurality of spaced apart horizontally extending rib members, and in which the securing means is attached to the lowermost one of the rib members. Preferably, the lowermost one of the rib members is positioned substantially adjacent the bottom of the outer bag.

The rib members may be located in sleeves attached to the outside of the outer bag. The sleeves will normally be made from the same material from which the outer bag is made.

The container apparatus may be one in which the base of the frame means is square, and in which there are four of the support members, there being one of the support members positioned at each one of the corners of the base.

The frame means may include an upper frame portion connecting the tops of the support members together. The upper frame portion may be hollow.

Usually, the support members and the upper frame portion when it is employed will be of square cross sectional shape. Other cross sectional shapes such for example as a rectangular or circular cross sectional shape may be employed if desired.

The outer bag may be made of a canvas material or a plastics material. The plastics material may be polyvinyl chloride. Other materials may be employed and the outer bag may be made in any desired colour or combination of colours.

The container apparatus may be manufactured and sold with or without the inner bag.

The inner bag will usually be made of a plastics material. The plastics material may be, for example, polyethylene. Any of the known materials employed for the known inner bags may be mployed.

An embodiment of th inv ntion will now be described s lely by way of example and with reference to the accompanying drawings in which:

Figure 1 is a simplied view of container apparatus

in a normal position;

Figure 2 shows the contain r apparatus of Figure 1 in a position ready for receiving an inner bag;

Figure 3 shows part of th apparatus in the position that it occupies in Figure 1; and

Figure 4 shows the apparatus of Figure 3 but in the position that it occupies in Figure 2.

Referring to the drawings, there is shown container apparatus 2 for the storage and transportation of fluid material. The container apparatus 2 comprises an outer bag 4 having an upper portion 6 and a bottom 8. The container apparatus 2 also has non-collapsible frame means 10 for supporting the outer bag 4. The container apparatus 2 further comprises securing and lifting means 12 for lifting the bottom 8 of the outer bag 4 towards a top part 11 of the frame means 10 and temporarily securing it in that position.

The frame means 10 comprises a base 14 and support members 16 which upstand from the base 14. The lifting means 12 is such as to raise the entire bottom 8 of the outer bag 4 towards the top part 11 of the frame means 30 whereby the raised outer bag 4 is able to receive an inner bag 18 shown schematically in Figure 2. The inner bag 18 has outlet means 20 for enabling fluid material in the inner bag 18 to be controllably removed as desired. The inner bag 18 acts as a liner bag which can be disposed of after use, the inner bag 18 thus preventing the fluid material from contaminating the outer bag 4 and the frame means 10. This in turn avoids the need to wash the outer bag 4 and the frame means 10 and this is advantageous since the washing of the outer bag 4 and the frame means 10 is time consuming and often impractical at some locations where the contents of the inner bag 18 are obtained.

As can be seen from Figure 2, the bottom 8 of the outer bag 4 is substantially parallel to the base 14 of the frame means 10 in the raised position of the outer bag 4. During lifting of the outer bag 4 from the position shown in Figure 1 to the position shown in Figure 2, the bottom 8 of the outer bag 4 remains substantially parallel to the base 14 of the frame means 10.

As can be seen from Figures 3 and 4, the means 12 is a cable operated securing and lifting means which comprises four cables 22 and a counter-weight 24 for each cable 22. The support members 16 are hollow as shown in Figures 3 and 4 and it will be seen that each one of the counter-weights 24 operates inside one of the support members 16.

The container apparatus 2 includes constraint means in the form of a plurality of spaced apart horizontally extending rib m mb rs 26. Th rib members 26 are for constraining sides 28 of the outer bag 4 so that they do not bulge outwardly and protrud beyond the sides of the container apparatus 2 as defined by th support members 16. Th cables 22 are attached to the lowermost one of the rib members 26 as shown most clearly in Figure 3. Also as shown most clearly in Figure 3, the lowermost on of the members 26 is positioned substantially adjacent the bottom 8 of the outer bag 4.

The rib members 22 are located in a spaced apart manner as shown around the outside of the outer bag 4 and they will usually be located in sleeves (not shown) attached to the outside of the outer bag 4.

As can best be seen from Figures 1 and 2, the base 14 of the frame means 10 is square and the four support members 16 are positioned one at each corner of the square base 14. The frame means 10 includes an upper frame portion 30 connecting the tops 32 of the support members 16 together. The upper frame portion 30 is manufactured to be an integral part of the support members 16. The upper frame portion 30 is hollow in the same manner as the support members 16. As can be seen from the drawings, the upper frame portion 30 and the support members 16 are of substantially square cross sectional shape.

In the position shown in Figure 2, the container apparatus 2 is particularly conveniently positioned for receiving the liner bag 18. If the frame means 10 were to be of a collapsible nature and were to be in the collapsed state, then a person wishing to install the inner bag 16 would have to bend or get down on hands and knees in order to position the inner bag 18. It would then normally require two persons to raise the frame means 10 from its collapsed state to its non-collapsed state and this is labour intensive. With the means 12 used in the present invention, there is no need to have a collapsible frame means as will be readily appreciated. As the inner bag 18 is filled with the desired chosen material, the outer bag 4 expands downwardly towards the base 14 of the frame means 10. This expansion is a controlled expansion with the combined weight of the counter-weights 24 acting against the increasing weight of the fluid in the inner bag 18. Thus, as the inner bag 18 is filled, each counter-weight 24 will move upwards in its support member 16 from the position shown in Figure 4 to the position shown in Figure 3. As can be seen from Figures 3 and 4, each cable 22 passes through a hole 34 at the top of its support member 16.

It is to be appreciated that the embodiment of the invention described above with reference to the accompanying drawings has been given by way of example only and that modifications may be effected. Thus, for example, the lowermost rib member 26 may be made of a lighter gauge than the other rib members 26. This is because the lowermost rib member 26 is mainly provided for providing a connection point for th cables 22 and th lowermost rib member 26 does not perform much of a constraining function. If desired, th counter-weights 24 in the two support members 16 which are on the sid of the container

apparatus 2 opposite to that where the outlet means 20 is situated may be heavier than the counter-weights 24 in the support members 16 on the side adjacent the outlet means 20. The reason for this is to facilitate discharge of all the fluid material contents from the inner bag 18 when it is inside the outer bag 4. More specifically, when discharging the last remaining amount of the fluid material, the heavier counter-weight 24 on the side opposite the discharge side (that is opposite the outlet means 20) will automatically raise that side of the outer bag 4 and therefore the inner bag 18 and cause the fluid material to flow towards the outlet means 20.

The base 14 will usually be in the form of a pallet so that the container apparatus 2 can be moved by a forklift truck. Other types of base 14 can however be employed.

The counter-weights 24 may be replaced by springs or other biasing devices.

Claims

1. Container apparatus for the storage and transportation of fluid material, which container apparatus comprises an outer bag having an upper portion and a bottom, non-collapsible frame means for supporting the outer bag, and securing means for temporarily maintaining the bottom of the outer bag adjacent a top part of the frame means, the frame means being such as to comprise a base and support members which upstand from the base, and the securing means being such as temporarily to maintain the entire bottom of the outer bag adjacent the top part of the frame means whereby the raised outer bag is at a height at which it is convenient to insert an inner bag requiring to be filled with the fluid material.

2. Container apparatus according to claim 1 in which the securing means is also such as to perform the function of raising the bottom of the bag.

3. Container apparatus according to claim 1 or claim 2 in which the bottom of the outer bag remains substantially parallel to the base of the frame means as it is raised, and in which the bottom of the outer bag remains substantially parallel to the base of the frame means in the raised position of the outer bag.

4. Container apparatus according to any one of the preceding claims in which the securing means comprises a cable-operated securing means.

5. Container apparatus according to claim 4 in which the cable-operated securing means comprises a plurality of cables, and a counter-weight or a spring for each cable.

6. Container apparatus according to any one of the preceding claims and including constraint means for constraining sides of the outer bag, the securing means being attached to the constraint means.

7. Container apparatus according to claim 6 in which the constraint means comprises a plurality of spaced apart horizontally extending rib members, and in which the securing means is attached to the lowermost one of the rib members.

8. Container apparatus according to claim 7 in which the lowermost one of the rib members is positioned substantially adjacent the bottom of the outer bag.

9. Container apparatus according to any one of the preceding claims in which the base of the frame means is square, in which there are four of the support members with one of the support members being positioned at each one of the corners of the base, and in which the frame means includes an upper frame portion connecting the top of the support members together.

10. Container apparatus according to any one of the preceding claims and including an inner bag.

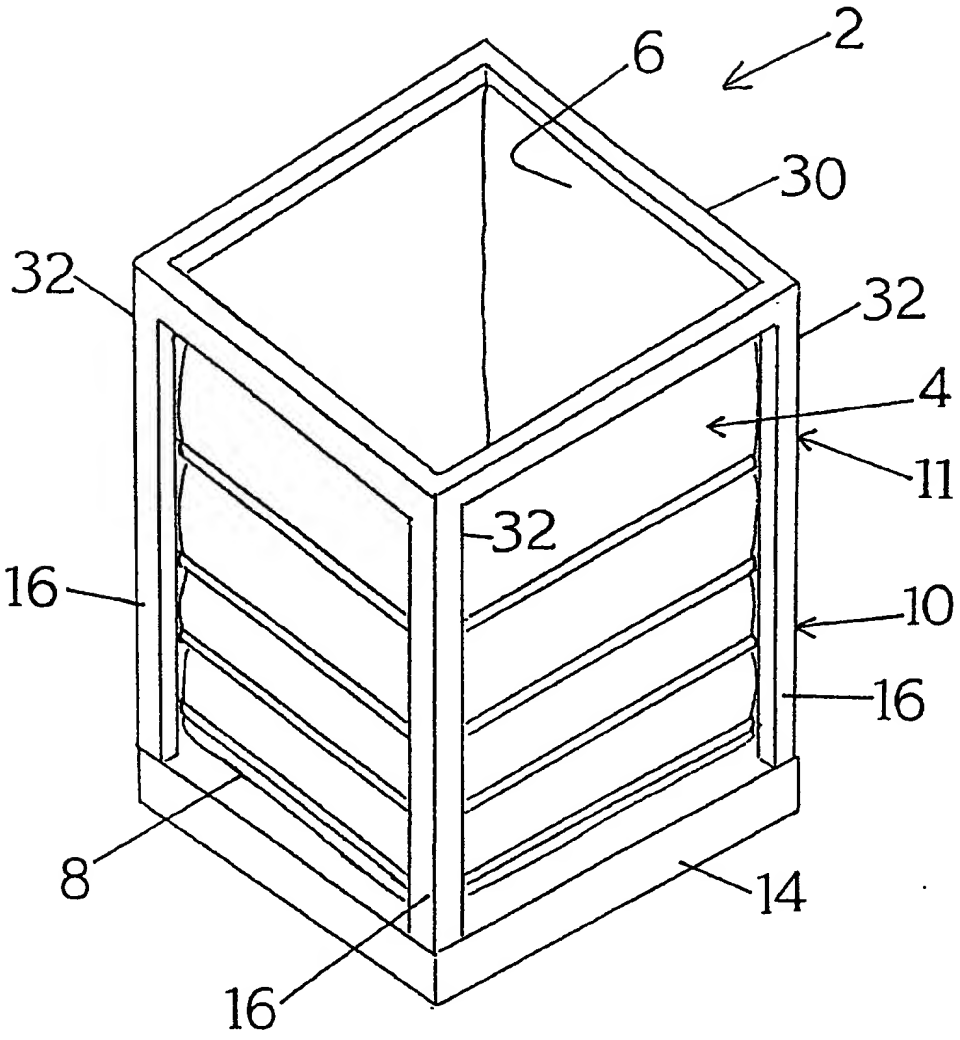

FIG 1

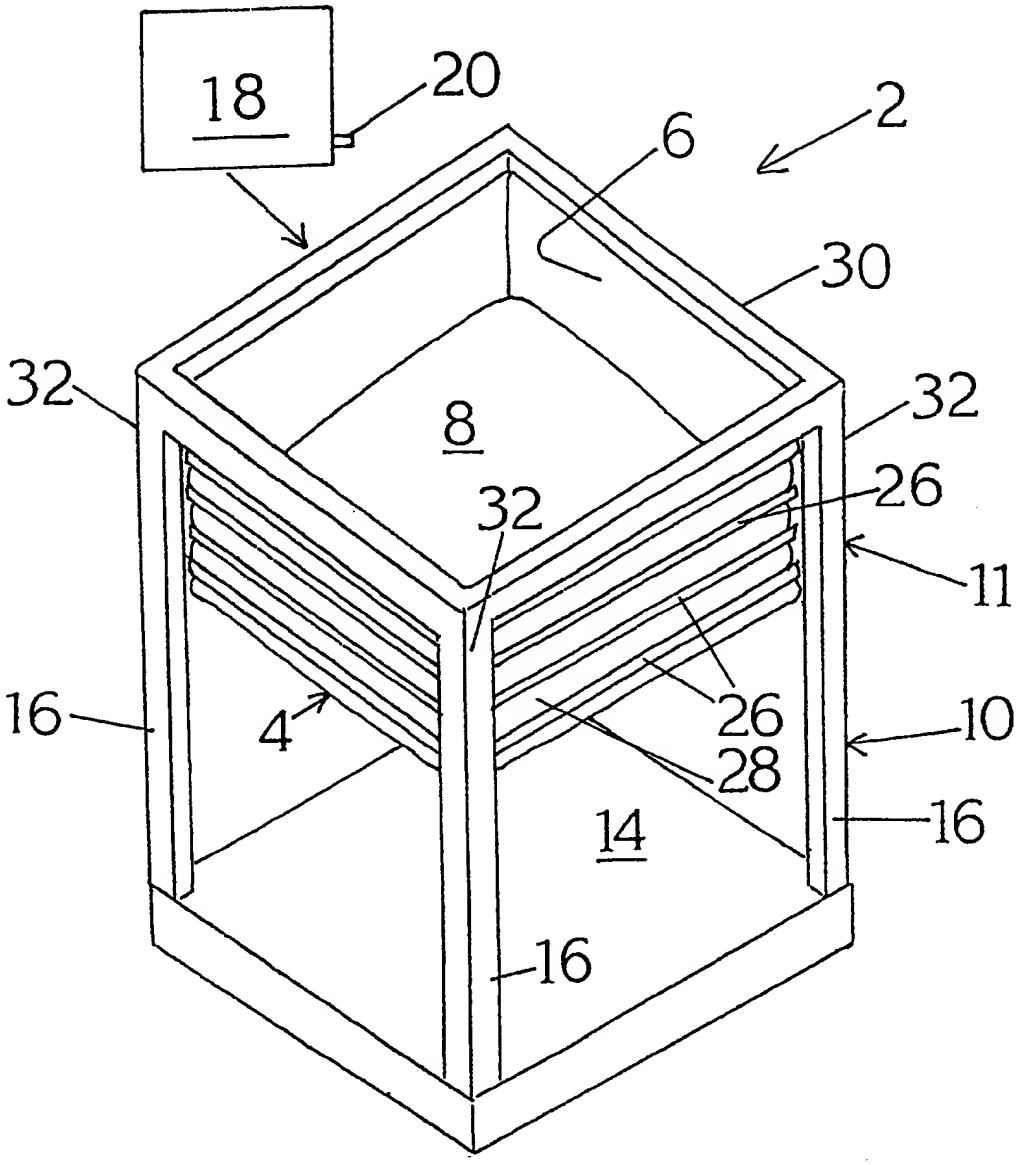

FIG 2

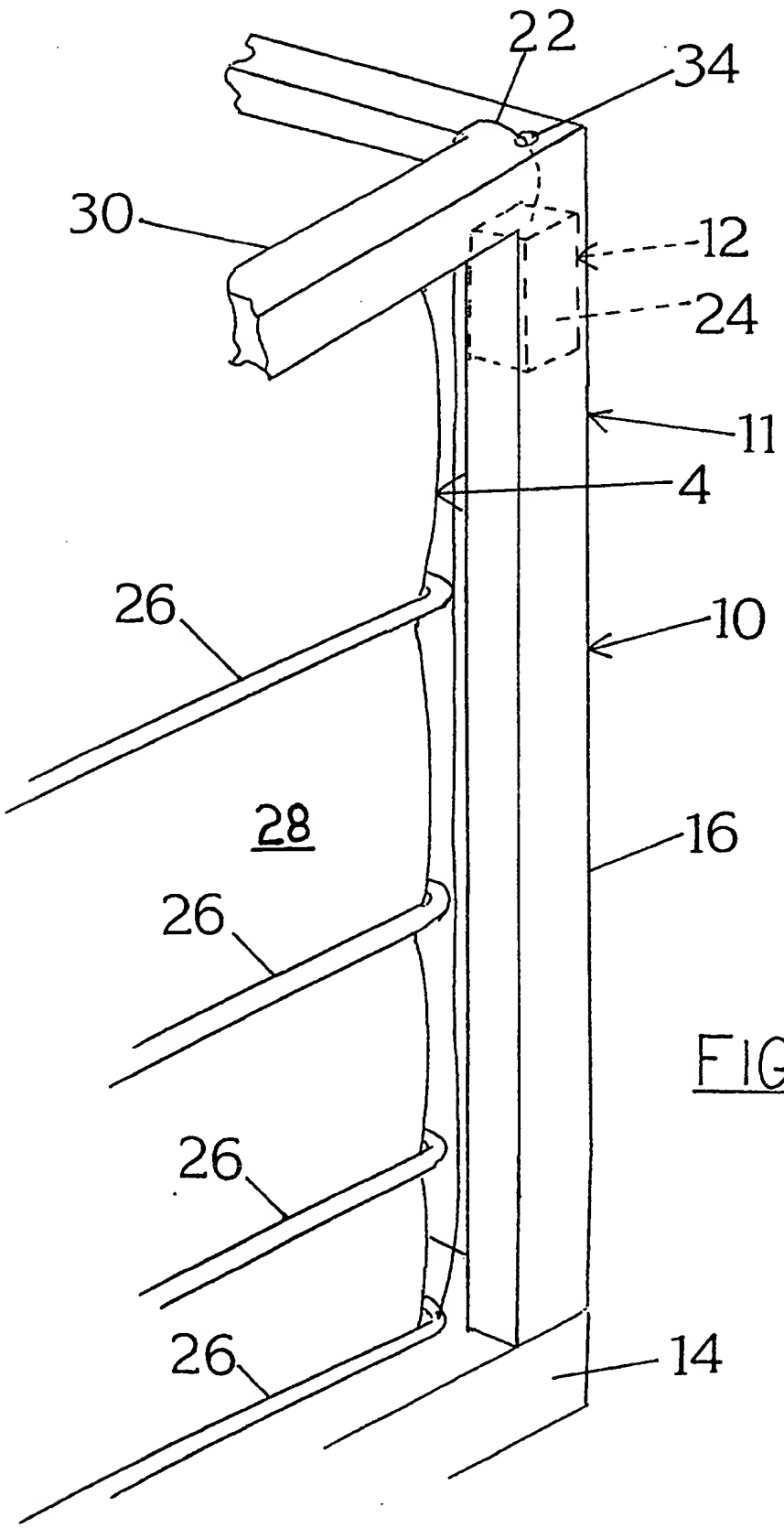

FIG 3

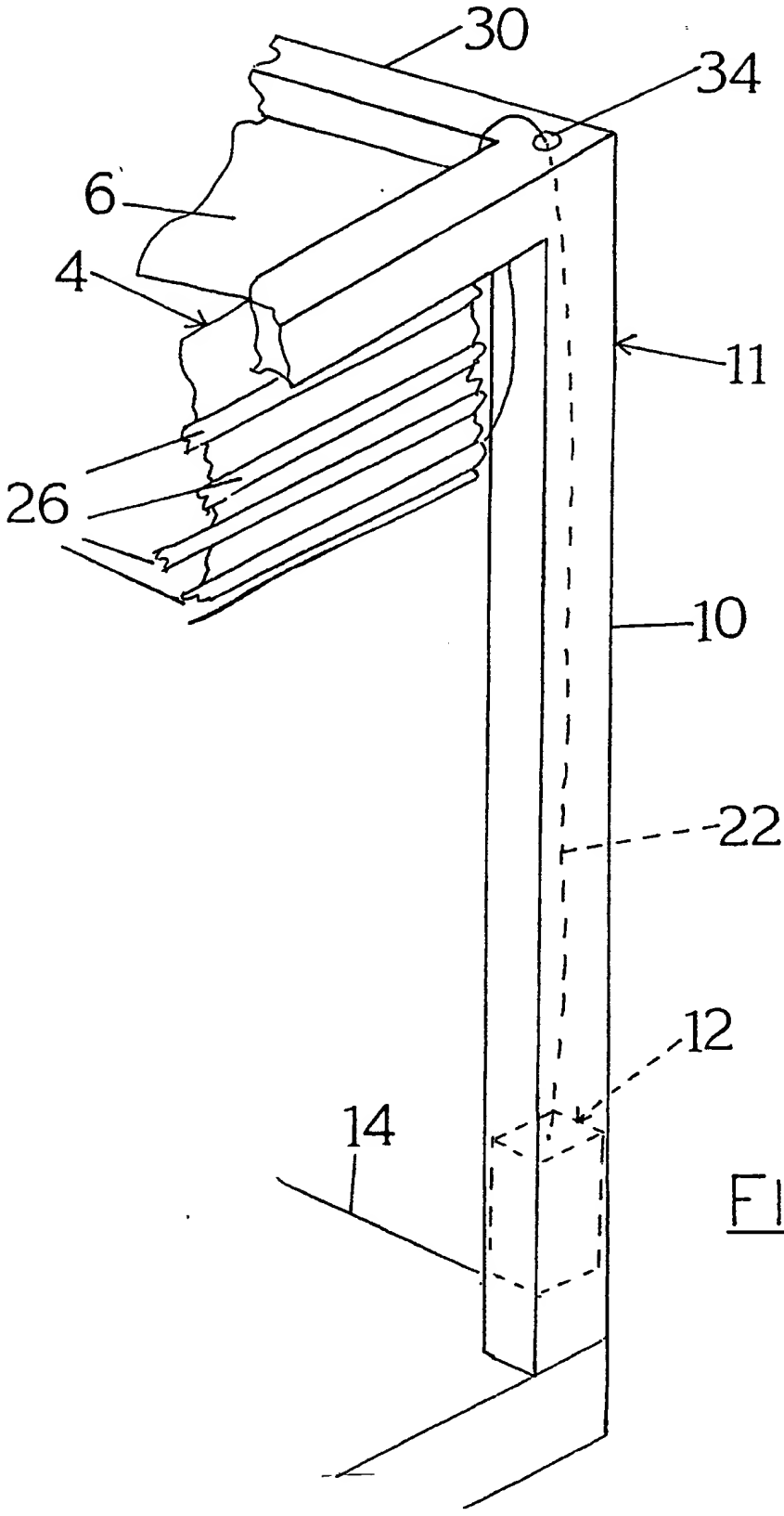

FIG 4